AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraphs beginning at page 1, lines 6-12, as follows:

TECHNICAL FIELD ~~OF THE INVENTION~~

The technical filed of the present ~~invention~~ disclosure relates to arrangements and a method in a third generation mobile telecommunication system and evolved variants thereof. In particular, the invention relates to arrangements and a method for handling macro diversity in a UMTS Radio Access Network (UTRAN).

BACKGROUND ~~OF THE INVENTION~~

Please amend the paragraphs beginning at page 5, line 8 through page 6, line 7, as follows:

SUMMARY ~~OF THE INVENTION~~

The consumed transmission resources are reduced according to a non-limiting aspect the present invention by distributing the macro diversity functionality to the Node Bs. A problem is then how to select which of the connected Node Bs that should be selected to perform the combining/splitting function, also referred to as a Diversity Handover (DHO) function. These selected nodes are referred to as DHO nodes. The DHO nodes ~~have to be~~ are selected out of those Node Bs that are able to perform the DHO functionality, i.e. out of those Node Bs that have been adapted with DHO functionality ~~and other functions of the present invention~~. These nodes are referred to as DHO

enabled nodes or macro diversity enabled nodes. One non-limiting example method for selecting the DHO nodes is disclosed in~~ the specification below~~ this disclosure, however other methods may also be used. When the DHO nodes are selected e.g. in accordance with the disclosed method, a method and arrangements for executing the macro diversity is required.

~~The object of the present invention is thus to provide a method and arrangements for executing the macro diversity function.~~

~~The problem is solved by the arrangements according to claims 26, 27, 28 and 45 and the method of claim 1.~~

~~The most important advantage~~ One of several significant advantages achieved by the present invention is transmission savings in the UTRAN transport network, which translate into significant cost savings for the operator. The transmission savings are realised through optimised location for the DHO functionality. Thereby the redundant data transport is eliminated in the parts of the path, where data pertaining to different macro diversity legs of the same DCH would otherwise be transported in parallel along the same route.

Another advantage ~~of the present invention~~ is that ~~it facilitates that~~ the RNCs may be located in more central locations of the network (i.e. with less geographical distribution). The main purpose of the current common geographical distribution of RNCs is to limit the transmission costs for the parallel macro diversity legs. When this parallel data transport is eliminated, it

becomes more beneficial for an operator to centralise the RNCs, e.g. by co-locating them with MSCs or MGWs. Co-locating several nodes on the same site results in simplified operation and maintenance, which also means reduced costs for the operator.

Please amend the paragraphs beginning at page 6, lines 22-24, as follows:

FIG. 4 illustrates ~~the~~ potential transmission savings in an illustrative non-limiting example with cascaded Node Bs ~~according to the present invention~~.

FIG. 5 illustrates a non-limiting example scenario with a mobile terminal using five macro diversity legs ~~according to the present invention~~.

Please amend the paragraphs beginning at page 6, line 27 through page 7, line 1, as follows:

FIG. 7 shows ~~the~~ a branching node tree corresponding to the route tree in FIG. 6.

FIG. 8 shows ~~the~~ a DHO node tree resulting from ~~the~~ selection of DHO nodes corresponding to the branching nodes of the example depicted in FIG. 5.

Please amend the paragraph beginning at page 7, line 5, as follows:

FIG. 10 shows ~~the~~ a non-limiting example of a modified DHO node tree after the first step of the delay reduction method number 5 ~~according to an embodiment of the invention~~.

Please amend the paragraph beginning at page 7, line 9, as follows:

FIG. 12 shows the modified DHO node tree after the second step of the delay reduction method number 5 ~~according to an embodiment of the invention~~.

Please amend the paragraph beginning at page 7, line 13, as follows:

FIG. 14 shows the modified DHO node tree after the third step of the delay reduction method number 5 ~~according to an embodiment of the invention~~.

Please amend the paragraph beginning at page 7, line 19, as follows:

FIG. 17 is a flowchart of ~~the~~ a non-limiting example method ~~according to the present invention~~.

Please amend the paragraphs beginning at page 8, lines 1-20, as follows:

In the further description of the present invention coordinated DCHs are not specifically treated. In the aspects that are significant, ~~to the present~~

~~invention~~ a set of coordinated DCHs is treated in the same way as a single separate DCH. The DCHs of a set of coordinated DCHs use a common transport bearer and in an IP UTRAN the frames (of a set of coordinated DCHs) with the same CFN are included in the same User Datagram Protocol (UDP) packet. The special combining procedure for coordinated DCHs has been described above. Thus, omitting coordinated DCHs serves to simplify the description ~~of the present invention~~ and makes the text more readable. To generalize the description of the present invention so as to comprise coordinated DCHs would be conceptually trivial for a person of ordinary skills in the art, although it would significantly complicate the text.

~~The present invention~~ One or more non-limiting aspects may be implemented in a third generation mobile telecommunications system, e.g. in a UMTS, and in particular in the Radio Access Network (RAN), e.g. a UMTS Terrestrial Radio Access Network, UTRAN. Such a system is illustrated in FIG. 1 and described above in conjunction with FIG. 1.

In order to reduce the required transmission resources, ~~the present invention proposes~~ it is proposed to distribute the macro diversity functionality from the RNC to other nodes for macro diversity configurations for which this is beneficial from a transmission point of view. These other nodes are typically Node Bs, but may also be other types of nodes, e.g. specialized Diversity Handover nodes. The potential transmission savings when the macro diversity is distributed to Node Bs are illustrated in FIG. 4. When a macro diversity

configuration, also referred to as a Diversity Handover (DHO) node tree (the term "DHO node tree" is further explained later) is established, or changed, it is ~~first required~~ preferred to select the Node Bs that should be the DHO nodes, i.e. the Node Bs that should perform the actual combining and splitting, before the macro diversity function is executed. The DHO nodes ~~have to~~ should be selected out of the available nodes that comprise DHO functionality, i.e. out of the DHO enabled nodes (typically DHO enabled Node Bs and RNCS). In the non-limiting examples below, the Node Bs and the RNC are used as DHO nodes, but it should be noted that other nodes such as specialized DHO nodes or logically or geographically distributed RNCs or future types of nodes implementing parts of the RNC functionality also may be used as DHO nodes.

Please amend the paragraph beginning at page 9, line 20, as follows:

~~Below is an~~ An example illustrative non-limiting of a method for selecting DHO nodes ~~disclosed~~ is described below. It should however be noted that other methods for this selection also may be used ~~in conjunction with the present invention~~.

Please amend the paragraphs beginning at page 10, line 5 through page 11, line 20, as follows:

~~The~~ To enable selection of the DHO node(s), ~~requires that~~ the RNC ~~comprises or is~~ should have or be adapted to retrieve information about the

topology of the UTRAN, both the UTRAN transport network and the Node Bs and RNCs. Different levels of richness of this information are conceivable. The choice of this level is a trade-off between the value it provides for the DHO node selection mechanism and the complexity it implies for the selection mechanism as well as the topology information retrieval mechanism. A certain level of flexibility of the richness of the topology information will be allowed in the further description of the DHO node selection.

However, ~~the~~ a non-limiting example topology information with a basic level of richness ~~comprises~~ can include:

-A hop-by-hop route from the RNC to each Node B that is controlled by the RNC and possibly some Node Bs that are controlled by neighboring RNCs, wherein each router is represented by the IP address associated with the interface that is used to forward packets in the direction of the RNC. The Node B is represented by one of its IP addresses, e.g. the one used for NBAP (Node B Application Part) signaling (or the primary IP address used for NBAP signaling in case multiple IP addresses are used for NBAP signaling). If a neighboring RNC is included in a hop-by-hop route, it is also represented by one of its IP addresses, e.g. the one used for RNSAP (Radio Network Subsystem Application Part) signaling (or the primary IP address used for RNSAP signaling in case multiple IP addresses are used for RNSAP signaling).

-A delay metric for each hop in a route. If no explicit delay metric is available, an approximation can be derived from the generic cost metric, which is described below, or all hops can be given the same delay metric.

-A generic cost metric for each hop in a route. If no such generic cost metric is explicitly available, a reasonable approximation can be derived from the delay metric or a fixed default cost metric can be used for all hops. Preferably, the RNC is adapted to use the topology information to maintain data representations of the hop-by-hop routes with associated metrics to all the Node Bs in the Radio Network Subsystem (RNS) (and possibly to some Node Bs controlled by neighboring RNCs, i.e. Node Bs in neighboring RNSs). The RNS comprises the RNC and the Node Bs that are controlled by the RNC. Then the routes are readily available when needed for a DHO node selection process. However, retrieving topology information and creating the hop-by-hop routes in real-time when needed is also a possibility if the RNC maintains a generic topology database. For instance if the Transport Network Layer (TNL) in the RNC maintains a link state routing topology database, it is conceivable that this database is consulted (e.g. by letting the Radio Network Layer (RNL) of the RNC interrogate the TNL of the RNC) in order to create the required hop-by-hop route representations in real-time. From a performance perspective it is preferable that the hop-by-hop routes are readily available when they are needed.

In addition to the required topology information the RNC ~~must~~ should be manually or automatically configured with knowledge about the relevant Node Bs that are able to comprise DHO functionality, also referred to as DHO enabled nodes. The DHO enabled nodes ~~are~~ include at least ~~constituted by~~ the DHO enabled nodes controlled by the RNC, but in inter-RNS macro diversity configurations they may also include other RNCs and Node Bs controlled by other RNCs. It is also possible that the DHO enabled nodes may include other, yet non-existing, types of Radio Network Layer (RNL) nodes, e.g. specialized DHO nodes. The RNC ~~is required to~~ should know at least one IP address of each DHO enabled node, preferably the IP address used for NBAP signaling (or RNSAP signaling in the case of an RNC). This IP address ~~is required to~~ should be the same IP address as is used to represent the node in a hop-by-hop route. The RNC may be adapted to use the list of DHO enabled nodes to include an indication of whether the node is DHO enabled or not for each node in the hop-by-hop routes.

Please amend the paragraph beginning at page 12, line 13, as follows:

In the case when the UTRAN transport network is ATM based, the topology database is based on ATM addresses instead of IP addresses. Otherwise the general properties of the topology database are similar to the properties of the database in the IP based UTRAN. Each hop in a hop-by-hop route is represented by an ATM address. For each hop there is an explicitly

defined or implicitly derived generic cost metric and an explicitly defined or implicitly derived delay metric. In the ATM based UTRAN, the topology database ~~has to~~ can be created through manual or semi-automatic management operations. The RNC uses the topology database in the same way in the ATM based UTRAN as in the IP based UTRAN.

Please amend the paragraphs beginning at page 12, line 25 through page 14, line 7, as follows:

It should be noted that, although the procedures of the DHO node selection algorithm are described below using the terminology of an IP UTRAN, they are equally applicable in an ATM UTRAN. In an ATM UTRAN the algorithms and procedures are ~~the same~~ similar, but ~~where~~ the routers are replaced by AAL2 switches and the IP addresses are replaced by ATM addresses.

The mechanism that the RNC is adapted to use in order to select the DHO node(s), i.e. the node(s) where the splitting and combining will be performed, is(are) substantially the same whether optimized NBAP and RNSAP signaling is used or not. One object of the DHO node selection mechanism is to select the DHO nodes in a way that minimizes one or more accumulated metric for the all the macro diversity legs. Such an accumulated metric may be a generic cost metric. This cost metric may be put together with ~~the~~ a condition

that for none of the resulting data paths is the resulting path delay allowed to exceed a maximum delay value defined for the UTRAN.

In the typical scenario, a DCH is first established with a single leg, i.e. without macro diversity. When a second macro diversity leg is added, the RNC selects a DHO node for these two legs and redirects the existing data flow if necessary (i.e. unless the selected DHO node is the Node B of the first leg or the RNC itself. When a third leg is added, the RNC is ~~required~~ likely to rerun the DHO node selection process from scratch, since the addition of the third leg may affect the selection of the first DHO node. ~~The~~ Alternatively, the RNC also has the choice to let the third leg go all the way to the RNC (without trying to find a better DHO node) in order to not to affect the previous DHO node choice and to avoid the signaling involved in redirecting the existing flows. The same (i.e. rerunning the DHO node selection process from scratch or terminating the new leg in the RNC) applies to subsequently added macro diversity legs.

~~The~~ A non-limiting example DHO node selection mechanism relies on the above described topology information involving both transport networks nodes (routers) and radio network nodes (Node Bs and one or possibly more RNCs). It also utilizes the list of DHO enabled nodes connected to the RNC (and possible some DHO enabled nodes in neighboring RNSs).

The RNC selects a first set of preliminary DHO nodes in a way that minimizes the total accumulated generic cost metrics for the entire macro diversity tree. It then checks whether the maximum allowed path delay is

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exceeded for any of the macro diversity legs according to one non-limiting embodiment. If the path delay is acceptable, the set of preliminary DHO nodes ~~is~~ can be kept. Otherwise the set of preliminary DHO nodes ~~is~~ can be modified by the RNC in a way that reduces the path delays until the path delays of all macro diversity legs are acceptable.

Selection of the First Set of Preliminary DHO Nodes

In short the RNC starts the DHO node selection process by forming a tree of the routes (retrieved from the topology database) to the involved Node Bs. It then identifies the branching nodes in the tree and their relative interconnections. Identifying the relative interconnections of the branching nodes in essence ~~means~~ implies that the RNC creates a simplified schematic tree ~~consisting of~~ that includes only branching nodes, Node Bs and the RNC (i.e. intermediate routers are omitted). The simplified schematic tree is illustrated in FIG. 7. For each branching node there is a corresponding potential DHO node and the RNC is arranged to proceed to select these DHO nodes. A detailed description of the complete process follows below.

Please amend the paragraph beginning at page 20, line 10, as follows:

The algorithm used for selecting a DHO node corresponding to a certain branching node is simple. Starting from the branching node the RNC is able to accumulate the generic cost metric in each direction (i.e. in the direction of each branch in the original route tree including the uplink) from the branching

node until a DHO enabled node (or the end of the path) is found. (If asymmetric generic cost metrics are used, the generic cost metrics ~~has to~~ should be the accumulated roundtrip from the branching node to the found DHO enable node and back. If symmetric cost metrics are used it suffices to accumulate the generic cost metrics in one direction.) The RNC does this by using the original route tree--not the simplified one. The DHO enabled node that was found with the smallest accumulated generic cost metric is selected as the DHO node corresponding to the concerned branching node. If the branching node is itself a DHO enabled node, it will of course be the selected DHO node, since it is obviously the best choice and the accumulated generic cost metric will be zero.

Please amend the paragraph beginning at page 21, line 7, as follows:

Returning now to the DHO node selection example based on the example scenario in FIG. 5, the DHO nodes corresponding to the identified branching nodes will be selected as follows. Since symmetric generic cost metrics are used in this example, the cost metric is accumulated in only a single direction between a branching node and a potential DHO node. The DHO node corresponding to branching node R7 is NB4, for which the accumulated generic cost metrics from R7 is 4. All the other DHO enabled nodes in the route tree have greater accumulated generic cost metrics from this branching node. Similarly, the selected DHO node corresponding to the branching node R5 is NB3, for which the accumulated generic cost metrics from R5 is 4. The selected

DHO node corresponding to the branching node R4 is NB3 again, for which the accumulated generic cost metrics from R5 is 7. The selected DHO node corresponding to the branching node R2 is NB1, for which the accumulated generic cost metrics from R2 ~~is 4~~ is 1.

Please amend the paragraphs beginning at page 36, lines 10-12, as follows:

~~PREFERRED EMBODIMENTS OF THE PRESENT INVENTION~~

Realization of a DHO Node Tree

When the DHO nodes, also referred to as macro diversity nodes, are selected e.g. according to the above described method, the RNC instructs the DHO nodes and other affected nodes so that the intended macro diversity is established ~~according to the present invention~~. DHO nodes receive instructions from the RNC by means of NBAP or RNSAP (~~RNSAP is only used~~ in the inter-RNS case) and perform the following in accordance with said instructions according to one or more non-limiting embodiments. ~~of the present invention:~~

Please amend the paragraphs beginning at page 37, lines 1-15, as follows:

When unmodified NBAP and RNSAP is used the DHO nodes may be adapted to split the downlink flow and to forward the resulting flows according to implicit information in the uplink data flow received from hierarchically

lower nodes. This implicit information ~~consists of~~ can include source IP addresses and UDP ports retrieved from the IP header and UDP header of received uplink packets.

For the uplink:

The DHO nodes are adapted to combine the uplink flows to a single uplink flow that is forwarded according to the instructions received from the RNC using a previously established transport bearer. The instructions may comprise IP addresses in an IP-based UTRAN or ATM addresses and SUGR parameters in an ATM based UTRAN. When unmodified NBAP and RNSAP are used the DHO nodes ~~are~~ can be adapted to identify the uplink flows to be combined through information retrieved from uplink packets received from hierarchically lower nodes.

The Node Bs with DHO functionality preferably use an adaptive timing scheme to optimise the trade-off between delay and frame loss in the uplink combining. ~~The timing scheme is however not within the scope of the present invention.~~

Please amend the paragraphs beginning at page 37, line 22 through page 38, line 29, as follows:

It should be understood that the method using instructions or other means to establish the macro diversity in accordance with the (logical) DHO node tree is independent of the method that is disclosed to obtain or create the

(logical) DHO node tree. Any other method to create the (logical) DHO node tree (i.e. to select the DHO nodes) can be used~~ in combination with the present invention~~.

If a transport network control plane protocol is used, the selected Node Bs with DHO functionality may use this control plane protocol to establish the inter-Node B transport bearers according to the instructions from the RNC. Examples of such transport network control plane protocols ~~are~~ include, among others, Q.2630 (for AAL2 connections) in an ATM based UTRAN and the control plane protocol being developed by the NSIS (Next Step In Signaling) workgroup in the IETF (Internet Engineering Task Force) in an IP based UTRAN.

To establish a hierarchical macro diversity structure the selected DHO nodes ~~need to~~ should be instructed so that they know where to send split downlink flows and what uplink flows to combine. These DHO node instructions ~~are~~ can be based on the DHO node tree that is the outcome of the DHO node selection process. Every time the DHO node tree changes (due to addition or removal of macro diversity legs) some or all the affected nodes (both DHO nodes and non-DHO Node Bs) need new instructions. ~~Instructions are also~~ Changed instructions may also be needed when DCHs are added or removed from all macro diversity legs. DHO nodes may also ~~according to embodiments of the present invention~~ need QoS instructions when DCHs are modified in a way that the QoS of their transport bearers have to be changed.

The affected nodes may range from a single to all Node Bs in the DHO node tree. No signaling is required when only the S-RNC is affected.

Realizing a DHO Node Tree with Modified Protocols

In order to direct the DCH data flows in accordance with the DHO node tree the RNC ~~is according to the present invention required to~~ can provide the involved Node Bs with the IP addresses and UDP ports (in an IP UTRAN) or ATM addresses and SUGR parameters (in an ATM UTRAN) that they need to establish the inter-Node B transport bearers. If a transport network control plane protocol is used, the Node Bs handle can this transport network control plane signaling between themselves and intermediate routers or AAL2 switches for inter-Node B transport bearers.~~However, there is no inter-Node B RNL signaling.~~

To direct a transport bearer between a DHO node or a leaf Node B (in the DHO node tree) and a hierarchically higher DHO node or the RNC in an IP UTRAN without ~~a~~ using the transport layer control plane protocol, the RNC conveys to the DHO node or leaf Node B the destination IP address and UDP port to be used in the uplink direction of the transport bearer. That is, in essence, unless the hierarchically higher node is the RNC itself, the RNC replaces an IP address and a UDP port of the RNC (that would have been included in the message if distributed macro diversity had not been used) by an IP address and a UDP port of the hierarchically higher DHO node. The

receiving node returns the destination IP address and UDP port to be used in the downlink direction of the transport bearer.

Please amend the paragraphs beginning at page 41, lines 1-12, as follows:

To convey all these instructions to the involved Node Bs the RNC ~~uses~~ can use anyone or more of existing unchanged NBAP messages (and RNSAP messages), existing modified NBAP messages (and RNSAP messages) and even new NBAP messages (and RNSAP messages).

One non-limiting aspect of the DHO related signaling is associated with the inter-RNS case. In the inter-RNS case the D-RNC more or less relays the information between the S-RNC and the Node Bs, using RNSAP towards the S-RNC and NBAP towards the Node Bs. It is however not a strict relay, since the D-RNC converts between two protocols.

Since the DHO related information in an RNSAP message sent from the S-RNC to a D-RNC may be intended for any of the Node Bs in the RNS of the D-RNC, there ~~must~~ should be a way for the S-RNC to indicate the intended recipient of the DHO related information. The preferred way to do this is to include a transport layer address (i.e. an IP address or an ATM address) of the intended recipient node together with the DHO related information that is included in an RNSAP message. This transport layer address should be the same address as the one that is used to represent the node in the topology

information, because this address is the only address of the node that the S-RNC is guaranteed to know. However, if the intended recipient node is the D-RNC, the included transport layer address may be any address of the D-RNC that the S-RNC knows, e.g. the one that is used in the topology information or the one that is used as the destination address for the transport bearer used for the concerned RNSAP message. Likewise a transport layer address may be associated with DHO related information in RNSAP messages sent in response from a D-RNC to a S-RNC.

Please amend the paragraph beginning at page 42, line 8, as follows:

In another non-limiting embodiment ~~of the present invention~~ the RNC realizes the DHO node tree (i.e. directs the transport bearers in accordance with the DHO node tree) using unmodified NBAP and RNSAP protocols. The regular message formats are used and no new parameters are introduced.

Please amend the paragraph beginning at page 42, line 17, as follows:

The embodiment without protocol modifications ~~can only be~~ is more appropriately used in an IP UTRAN without an IP control plane protocol. The reasons for this will be apparent from the further description of the solution.

Please amend the paragraphs beginning at page 44, line 24 through page 45, line 18, as follows:

As stated above the RNC ~~cannot~~ may not explicitly instruct a DHO node of what destination IP address and UDP port to use for a transport bearer towards a hierarchically lower node. Actually, the RNC ~~cannot~~ may not even explicitly inform a Node B that it has been selected as a DHO node and when the DHO functionality should be initiated or terminated. Instead a DHO enabled Node B has to rely on implicit information in the data flows to trigger initiation and termination of the DHO functionality and to find out where to direct split data flows.

A DHO enabled Node B checks the source address of all the IP packets it receives at the IP address and UDP port allocated to the transport bearer(s) of a certain DCH. If a packet with a source address other than that of the next hierarchically higher node (or one of its next hierarchically lower nodes if the Node B is already acting as a DHO node) is received, this packet has to originate from a hierarchically lower node. This indicates to the Node B that it has become a DHO node for a new macro diversity leg of the concerned DCH and the destination IP address and UDP port to use for the split downlink flow for the new macro diversity leg are the same as the source IP address and UDP port of the received packet. The Node B then initiates the required DHO functionality and starts to perform splitting and combining accordingly. This principle ~~cannot be~~ is not used in an ATM UTRAN or an IP UTRAN with a

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transport layer control plane protocol, because in these types of UTRAN a Node B cannot send data to a hierarchically higher node, until the hierarchically higher node has established the transport bearer towards the Node B.

The Node B does not receive any explicit QoS instructions for the new transport bearer towards the hierarchically lower node, so if needed, the Node B ~~has to derive~~ derives the required QoS information from the DCH characteristics (which is already known in the Node B) or ~~copy~~ copies the QoS class (e.g. DiffServe code points) used for the transport bearer of the same DCH towards the next hierarchically higher node.

Please amend the paragraph beginning at page 49, line 1, as follows:

Another possible variation of the trigger mechanisms for termination of DHO functionality is to use timers instead of frame counters, but this variation would ~~probably perform worse~~ not necessarily improve performance, since the TTI may be different for different DCHs. (Adapting the timeout value for the timers to the TTI of each DCH would eliminate this problem, but then there would in practice be no difference between running a timer and counting TTIs.)

Please amend the paragraphs beginning at page 49, line 15 through page 50, line 11, as follows:

Using implicit information in the data flow to trigger termination of DHO functionality (as described above) ~~inevitably means~~ implies that a DHO node

will maintain DHO functionality for a DCH macro diversity leg for a period of time after the point in time ~~when~~ after the hierarchically lower node ~~stopped~~ stops sending uplink frames on the concerned transport bearer. Consequently the DHO node (denoted A to simplify this description) will keep sending split downlink frames to an IP address and UDP port that are no longer allocated to this DCH transport bearer in the hierarchically lower node (denoted B).

If the hierarchically lower node (B) has reallocated this IP address and UDP port to another DCH transport bearer (towards another hierarchically higher node C (note that ~~node B~~ node A and node C may be the same node but for different DCHs)), this situation will cause the DHO functionality to malfunction in the hierarchically lower node (B). The packets that the hierarchically lower node (B) receives from the erroneously splitting DHO node (A) has a different source IP address and UDP port than the packets received from the correct hierarchically higher node (C). Thus, if the hierarchically lower node (B) is DHO enabled, it will interpret the erroneously split packets from the old hierarchically higher node (A) as packets from a new hierarchically lower node and thus will initiate DHO functionality for what it believes to be a new macro diversity leg towards a hierarchically lower node (whereas it actually is an old macro diversity leg towards the old hierarchically higher node (A) which the old hierarchically higher node (A) has not stopped using yet). If the hierarchically lower node (B) is not DHO enabled, the situation may cause unpredictable behaviour in the hierarchically lower node (B).

To avoid this problem a Node B ~~must~~ can make sure not to reallocate an IP address-UDP port pair for a time period no shorter than maxErroneousDHOperiod. After this time period a Node B may safely reallocate an IP address-UDP port pair, since any DHO functionality using this IP address-UDP port pair in a hierarchically higher DHO node ~~is surely~~should be terminated by then. This grace period for reallocation of IP address-UDP port pairs is a new functionality in a Node B. Hence, legacy (non-H-DHO aware) Node Bs in general cannot be used as leaf Node Bs in the solution with unmodified protocols. However, if a legacy (non-H-DHO aware) Node B filters incoming packets based on the source IP address (or source IP address and UDP port) such that packets with an unexpected source IP address (or unexpected source UDP port) are discarded, then this legacy Node B can be used as a leaf Node B in the solution with unmodified protocols.

Please amend the paragraph beginning at page 52, line 6, as follows:

To summarize, as illustrated in FIG. 17, ~~the~~ a non-limiting method for providing DHO related instructions to a first DHO tree node, e.g. a Node B, that is or is planned to be a part of a DHO connection in a mobile telecommunication network, wherein the DHO functionality is distributed to one or a plurality of DHO nodes, such as a Radio Network Controller, RNC, and its connected Node Bs, in said network, comprises the steps of:

-1701. Include in a first signaling message one or more transport layer addresses and one or more transport bearer reference parameters in order to direct one or more data flows of the DHO connection.

1702. Send said first signaling message to the first DHO tree node.

Please amend the paragraphs beginning at page 52, line 27 through page 53, line 4, as follows:

Thus, ~~the~~ a non-limiting example RNC ~~in accordance with the present invention~~ comprises means for including in a signaling message one or more transport layer addresses and one or more transport bearer reference parameters in order to direct one or more data flows of the DHO connection and means for sending said signaling message to a DHO tree node.

Moreover, ~~the~~ a non-limiting example DHO node ~~in accordance with the present invention~~ comprises means for using implicit information in data received from a hierarchically lower DHO tree node to trigger the initiation of DHO functionality for a macro diversity leg towards the hierarchically lower DHO tree node, wherein said DHO functionality comprises splitting and combining of data flows.